

HOME SERVERS

INTRODUCTION

Storing files on a home network is very convenient, as it enables you to access your documents and media files from any of your computers. The easiest way of adding storage to a network is to buy a network-attached storage (NAS) device. These are relatively inexpensive, but they have disadvantages. Many have no built-in backup facilities, so if the disk fails you'll lose all your data, and very few can be upgraded with more disks if you run out of space. What's more, if you find that your NAS device lacks a feature that you need, such as a media server, you may be stuck, as they're usually impossible to upgrade.

The best solution is to use a small server. These work like a NAS, but you can add storage and features when you want. They can also back up your data, keep it secure and look after any other task you need running 24/7, such as CCTV. We've tested four low-cost examples.

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CIVIL SERVICE

A server can transform your home network, providing access to all your files, music and movies from any PC. We test four

Choosing a... Home Server

A server may look like any other PC, so it's tempting to choose one based on the same criteria you'd use when picking a PC for general use. This is a mistake, though, as a server needs to perform very different tasks. In this guide, we'll explain what to look for when choosing a server for your home.

OFF WITH ITS HEAD

All the servers in this group can be used headlessly. In other words, once configured they can be hidden in a cupboard and will work without a keyboard, mouse or monitor attached. If you need to change your server's configuration, you can use Microsoft's Remote Desktop Connection software. This gives you complete control of the server from another PC. Remote Desktop is supported by Windows XP Professional, Windows Vista Business, Windows Vista Ultimate and the Windows Server operating systems.

Even if you don't want to use your server headlessly, you must choose your operating system carefully. Two of the servers in this test come with Windows XP Professional installed. This includes Microsoft's web server software, Internet Information Services (IIS), which is limited to serving a single website for up to 10 users. If you want to host more websites, you would

need to add a different server, such as Apache, which is free. It's easy to use Windows XP to act as a fileserver, and to serve media files using the latest version of Windows Media Player (version 11).

The other two servers, from Evesham and Fujitsu Siemens, don't include an operating system. This gives you the freedom to choose, but unless you use a free Linux operating system, you'll need to budget for one. Windows Server operating systems are ideal and include a central interface for managing the system, but they're fairly expensive. What's more, not all servers can run every operating system; we couldn't install Windows XP Professional on the Fujitsu Siemens server (see page 110).

MORE IN STORE

All the servers in this group have Gigabit Ethernet ports. This means they can send data over a wired network very quickly, but only if your other PCs and any routers or switches support Gigabit networking. The servers work perfectly well at the standard 10/100 Ethernet speeds, though, and any 10/100 computer can access data on a Gigabit network, albeit more slowly.

The amount of storage space you need in your server depends on the type of data you need to store.



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EVESHAM SilverEDGE 200AH

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RL SUPPLIES Modula HS500

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If you want to store Word or Excel documents, for example, a server with a 160GB disk will suffice. On the other hand, if you want to hoard DVD-quality video, you'll need at least 500GB for even a modest collection. A single full-quality DVD can consume up to 8.5GB of space.

Fujitsu Siemens' Primergy Econel has a single 160GB disk, but the other servers here include multiple hard disks. If you need more storage capacity, adding another internal hard disk is inexpensive; a 500GB SATA disk costs £75.

TOMB RAIDERS

The servers in this group that have multiple hard disks are configured to use a technology called RAID. A RAID array combines two or more physical disks into a single drive, which, depending on the type of array you choose, can protect your data from disk failure.

All the servers in this group support RAID 0 and 1. RAID 0, also known as striping, breaks data into equal-sized chunks and writes them across multiple hard disks. For example, PC Nextday's Zoostorm comes pre-configured with a RAID 0 array of two 160GB disks, which Windows sees as a single 320GB drive. This is much faster than a single disk, but if one of the disks fails, you will lose all the data on both disks.

RAID 1, also known as mirroring, duplicates all your data on a second hard disk. If one disk should fail, your data remains safe on the other.

Because of this duplication, a RAID 1 array of two 160GB disks provides only 160GB of space.

The PC Nextday and RL Supplies servers also support RAID 5. This requires three or more disks, and you can use the combined space of all but one disk for storage. For example, the RL Supplies Modula has an array of three 250GB disks, so you get 500GB of space. If one disk fails, the system can reconstruct your data from the information stored on the other two. For more about configuring a RAID array, refer to *Upgrade Workshop, Shopper*, November 2006.

THE SOUND AND THE FURY

Servers are designed to run continuously so that you can access your data whenever you like. They should therefore be unobtrusive, generating as little heat and noise as possible.

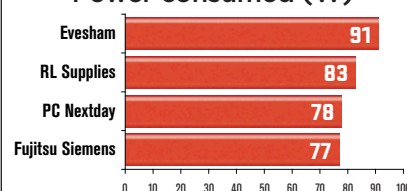
The Evesham SilverEDGE and the Fujitsu Siemens Econel were the quietest servers in this group, while the Zoostorm was by far the noisiest. We measured the temperature of each server around its rear exhaust fan and inside the case itself. The coolest server was the Modula at 24°C, while the other servers were a little hotter, running at 28°C.

In the event of a power cut, we'd expect a server to reboot itself once power is restored. All the servers in this group can do so, although the SilverEDGE and the Zoostorm need to have an option enabled in the BIOS to make this work.

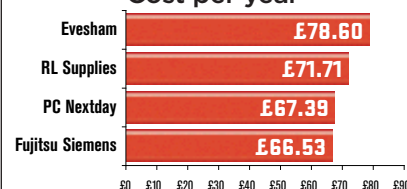
Running costs

You're unlikely to use your server as a convenient central repository for all your files if you constantly have to walk over to it to turn it on and off. It's far more convenient to leave it running, but this will increase your electricity bill. We measured how much power each server consumed in this test and calculated a running cost per year. These figures are based on an electricity cost of 10p per kilowatt hour.

Power consumed (W)



Cost per year



Evesham SilverEDGE 200AH

★★★★

£586 inc VAT

Evesham's SilverEDGE 200AH is very fast at copying files, but it's also more expensive than the other servers here and it doesn't come with an operating system.

FEATURES

Despite being the most expensive server here, the SilverEDGE comes without an operating system installed, so you'll have to budget for one. Evesham offers only variants of Windows Server 2000, the cheapest of which costs £353, but you could install a cheaper system such as Windows XP Professional or Linux.

The SilverEDGE comes equipped with two 160GB hard disks, which are configured as a RAID 0 array by default, providing 320GB of storage capacity. This isn't as generous as the servers from PC Nextday or RL Supplies, but you can fit two additional hard disks for more storage space.

In the event of a power cut, the SilverEDGE automatically restarts itself when the power is restored, but you will have to enable this option in the BIOS. The SilverEDGE was quiet and unobtrusive in use, even when performing several tasks simultaneously.

The one-year warranty that Evesham provides isn't particularly lengthy, but it does include onsite service. This can help to reduce



downtime in the event of a hardware problem, which is invaluable if your home office or small business depends on the server.

PERFORMANCE

We were impressed by the SilverEDGE's consistently fast performance in our file transfer tests. It was easily the fastest server in most of our tests, and was only very slightly behind the RL Supplies Modula in the large file read test. It's faster than any network-attached storage device we've seen, but it has only 320GB of storage space in its default configuration, so you won't be able to hoard a huge video collection without upgrading.

This is a shame, as the SilverEDGE is certainly fast enough to use as a network media server. A DVD movie stored on the SilverEDGE played smoothly over our network when viewed both

from a network media player and another PC, although there was a slight pause between DVD chapters. The movie continued to play smoothly even when we copied files to the SilverEDGE at the same time.

The results of our application benchmarks show that the SilverEDGE is powerful enough to handle non-server tasks such as image editing and video encoding. It was the second-fastest server here thanks to its dual-core Pentium D processor and 1GB of RAM, although the RL Supplies Modula wasn't far behind.

VERDICT

If you regularly need fast access to your data, the SilverEDGE's consistently fast file transfer speeds make it attractive, but it comes with just 320GB of storage space. The SilverEDGE is also the most expensive server in this group, and it's particularly expensive if you choose to add a Windows Server operating system. Unless you'll be transferring loads of data regularly, we'd recommend spending less.

SUMMARY

- ✓ Consistently fast file transfers
- ✗ Limited storage
- ✗ Expensive; no operating system

HEADLESS HOME SERVER Intel Pentium D 925 processor, 1GB memory, 320GB boot disk, ATI ES1000 graphics
PART CODE SE200AHJUL07
SUPPLIER Evesham 08701 609500
DETAILS www.evesham.com

Fujitsu Siemens Primergy Econel 100

★★★★

£322 inc VAT

The Primergy Econel 100 is the cheapest server in this group, but Fujitsu Siemens has had to make too many compromises to keep its price low.

FEATURES

The Econel's plain grey case is unassuming but it is blissfully quiet. It's the only server in the group to come with a keyboard and mouse. The mouse has an antiquated ball mechanism and the springy keyboard is uncomfortable to type on for long periods, but they're more than adequate for occasional use with a server.

No operating system is included so you'll have to buy one separately. To install it you have to use the included DVD-based setup wizard, but this supports only Windows Server 2000, Windows Server 2003 or certain distributions of SuSE and Red Hat Linux. We tried to install a cheaper copy of Windows XP by booting from its CD, but it couldn't recognise the Primergy's hard disk.

The Econel provides the least storage space of any server in this group thanks to its single 160GB hard disk. There's room inside for four more hard disks, but there are only three spare SATA ports, so to get the maximum of five disks you'll need to use one PATA disk or a PCI-



to-SATA adaptor card. A one-year onsite warranty is included.

PERFORMANCE

A DVD movie stored on the Econel played smoothly over our network, both on a network media player and a PC. Playback continued uninterrupted even as we copied files to the Econel's hard disk at the same time.

Sadly, we were disappointed by the Econel's performance both in our file transfer tests and our Windows application benchmarks. With a single disk we didn't expect the Econel to match the speeds of the RAID 0-equipped servers in this group, but its file-copying times were still disappointing. Particularly slow speeds when writing small files make it unsuitable for storing lots of small files, such as system backups.

As a server the Econel is unlikely to be used for regular PC tasks such as image editing, which is just as well, as it was the slowest computer here in our application benchmarks. It's the only server in our group to have a single-core processor, a 3GHz Pentium 4, so it suffered in our video-encoding test.

VERDICT

If you don't have a lot of money to spend on a server, the Primergy Econel 100's low purchase price is especially attractive. It could be a false economy, though, as you'll almost certainly have to buy one of the few operating systems it supports, as well as additional hard disks. Its slow application benchmark scores aren't particularly disturbing given that it's unlikely to perform these tasks, but its slow file transfer results do indicate that it would make a poor file server in its current configuration. We recommend spending a little more on the RL Supplies Modula.

SUMMARY

- ✓ Inexpensive
- ✗ No operating system included
- ✗ Very limited storage

HEADLESS HOME SERVER Intel Pentium 4 531 processor, 1GB memory, 160GB boot disk, ATI Rage XL graphics
PART CODE VFY:ECO100-918GB
SUPPLIER www.it247.com
DETAILS www.fujitsu-siemens.co.uk

PC NEXTDAY Zoostorm 7-3320



£479 inc VAT

PC Nextday's Zoostorm 7-3320 looks, and sounds, more like a standard home PC than a dedicated server. Unlike the Evesham and Fujitsu Siemens servers, it comes with Windows XP Professional installed and ready to use.

FEATURES

The Zoostorm is easily the loudest server in this group. Although we were able to reduce its noisiness by turning on the Smart Fan Control option in its BIOS, it is still distractingly loud. The Zoostorm has some useful extras, such as a memory card reader, a copy of Microsoft Office and a wireless networking adaptor, but the memory card reader and Microsoft Office are likely to be of little use on a server.

We were more impressed by the significant amount of storage space included inside the Zoostorm. In addition to a 250GB boot disk, it has two 320GB hard disks configured as a RAID 0 array by default. This provides another 640GB of storage space. You can add another two hard disks to the case, but there's only one free SATA port.

Like all the other servers in this group, the Zoostorm can restart itself automatically in the event of a power cut once power has



been restored. This option does have to be specifically enabled in the BIOS, though. A one-year onsite warranty is included.

PERFORMANCE

With a fast Core 2 Duo processor and 2GB of RAM inside, the Zoostorm was easily the fastest computer in this group in all our Windows application benchmarks. This could be useful if you occasionally need to use the Zoostorm for everyday PC tasks, but it's unlikely to be of much use if you require a server that's operated largely over a network.

We were more concerned with its performance in our file transfer tests. The Zoostorm wasn't particularly fast in our large file transfer tests, although it still attained respectable scores. It was very slow in our small

files tests, however. It was by far the slowest server here when reading small files and didn't perform well when writing them, making it a poor choice if you want to back up all your system files to the server.

VERDICT

Of all the servers in this group, the Zoostorm is the one that feels most like a general-purpose PC. A server should be left on all the time to provide convenient access to your data, but the Zoostorm's noisiness makes this undesirable. Its disappointing results in our file transfer tests also make it less than ideal for use as a central network repository for all your data, which is a shame as it has plenty of hard disk space.

Although generous, the included memory card reader and copy of Microsoft Office would be more useful in a budget PC than on a network server. We'd recommend the more suitable Evesham SilverEDGE or RL Supplies Modula instead.

SUMMARY

- ☒ Lots of storage space
- ☒ Very slow when writing small files
- ☒ Noisy

HEADLESS HOME SERVER Intel Core 2 Duo E4400 processor, 2GB memory, 250GB boot disk, 598GB storage, Intel Graphics Media Accelerator 950 graphics
PART CODE Zoostorm 7-3320
SUPPLIER PC Nextday
DETAILS www.pcnextday.co.uk

RL SUPPLIES Modula HS500



£500 inc VAT



The Modula HS500 isn't as fast as Evesham's SilverEDGE, but it's a desirable server with some useful and unique features.

FEATURES

The Modula is the only server in this group equipped with removable disk trays. As well as an 80GB system disk it includes three 250GB hard disks, in three removable trays, configured as a 500GB RAID 5 array. If one disk fails, you can simply replace it, leaving your data safe and intact. Alternatively, you could configure two disks as a RAID 1 array and use the third as a backup, removing it from the PC and keeping it somewhere safe.

Like all the other servers in this group, the Modula restarts automatically after a power cut. Unlike the Zoostorm and the SilverEDGE, you won't need to fiddle with the BIOS to get this feature working; it's enabled by default.

RL Supplies sells the Modula with Windows XP Professional installed. This isn't a dedicated server operating system, but it's perfectly suitable for home server use, and enables you to start using your server immediately. RL Supplies doesn't include an onsite warranty, but you do get two years of cover.



PERFORMANCE

Although the Modula is fast at reading files in its default RAID 5 configuration, it was very slow when writing both large and small files. This is a known limitation of the RAID 5 system, so we reconfigured two of its disks into a RAID 0 array to provide a fair comparison with the PC Nextday and Evesham servers. This made the Modula significantly faster when writing small files, but when writing large files it still lagged behind the Evesham SilverEDGE. This is disappointing, but the Modula is fast enough for regularly sharing files across your network.

We had no trouble watching a DVD movie stored on the Modula over our Ethernet network, either in the RAID 0 or RAID 5 configuration. When configured as a RAID 5 array we spotted

some stuttering and dropped frames in the movie while we copied files to and from the Modula. With the disks configured as a RAID 0 array the system performed both tasks simultaneously without any difficulties.

The Modula is also powerful enough to use as a general-purpose PC if necessary. Although it was only the third fastest computer in our Windows benchmarks, it was only a couple of points behind Evesham's SilverEDGE. Its dual-core Athlon processor is noticeably quicker than the single-core Pentium 4 used in the Fujitsu Siemens Primergy Econel.

VERDICT

RL Supplies' Modula HS500 is a well-equipped server with loads of hard disk space, plenty of power and convenient removable disk trays. It isn't nearly as fast as Evesham's SilverEDGE at writing large files in RAID 0 mode, but it's ideal as a general home server.

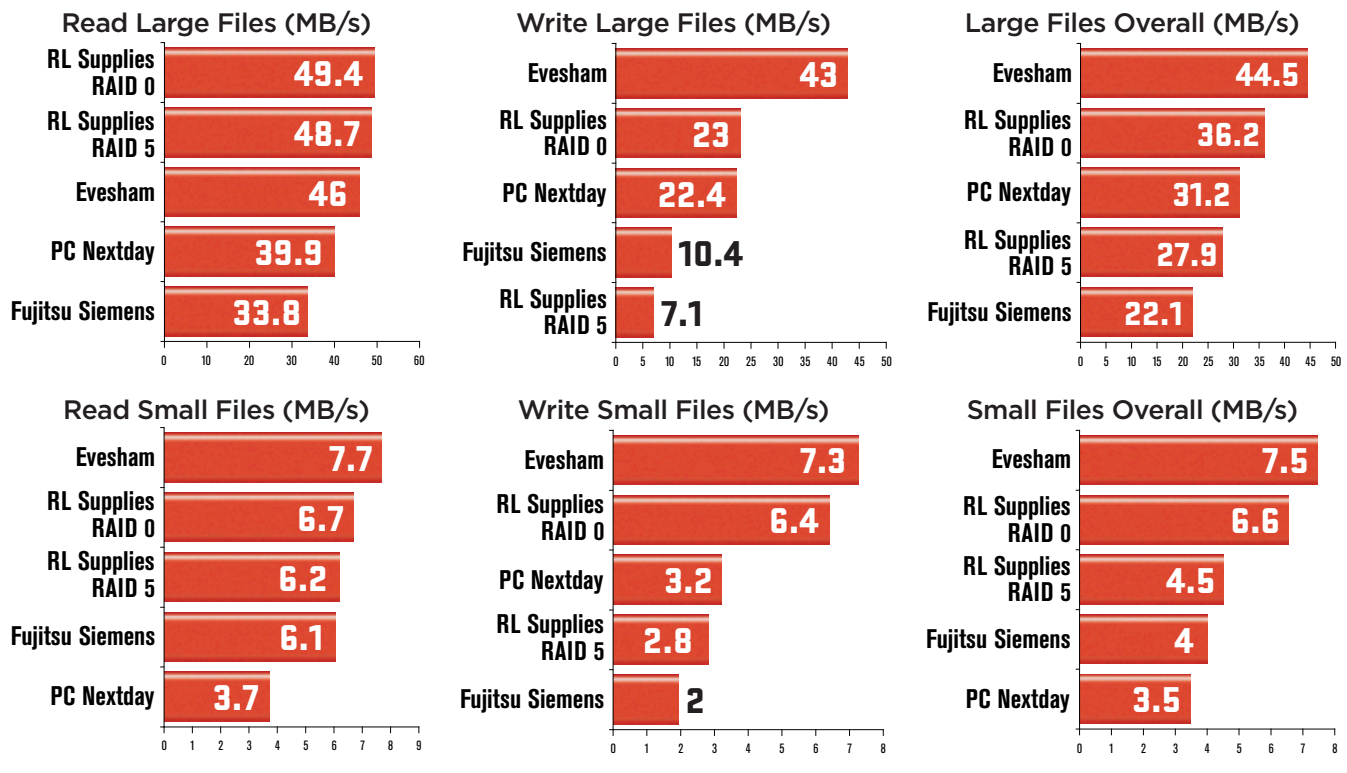
SUMMARY

- ☒ Removable disk trays
- ☒ RAID 5 array
- ☒ Poor RAID 0 large file write speeds

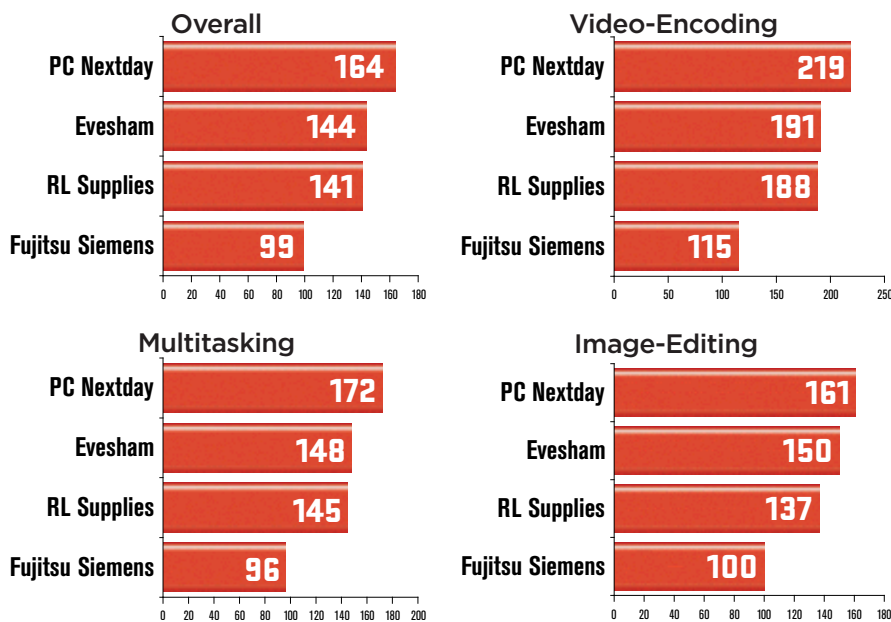
HEADLESS HOME SERVER AMD Athlon 64 X2 4000+ processor, 1GB memory, 80GB boot disk, 465GB storage, Nvidia GeForce 6150SE graphics
PART CODE Modula HS500
SUPPLIER RL Supplies 01923 896996
DETAILS www.rlsupplies.co.uk

BENCHMARKS

Performance Networking file serving speeds



2D Performance Shopper application tests



Computer Shopper's 2D benchmarks show how PCs stand up to the toughest tasks Windows can throw at them. Today's PCs have no problem running office applications, so we focus our tests on areas where you could experience difficulties.

There are four scripts. Encoding a video to MPEG2 format is a processor-intensive task that anyone interested in transferring home videos to DVD will have to tackle. Our image-editing test simulates a session of photo enhancement using Paint Shop Pro X. In our third test, a set of audio files is ripped to MP3 format. Finally, the multi-tasking test is designed to test the real-life benefits of Hyper-Threaded and dual-core processors. This test compresses a DVD for playback on a Pocket PC while simultaneously running our image-editing test.

Figures are relative to a reference Evesham Athlon 64 3500+, which scores 100 in all tests.

SETTINGS We run our application tests at the 1,280x1,024 resolution in 32-bit colour

WEB www.computershopper.co.uk

Labs verdict Home servers

Many Shopper Labs tests are hotly contested and difficult to judge, but this month's test of home servers proved surprisingly clear cut. Two servers immediately stood out as better than the others, and one is particularly good.

Evesham's SilverEDGE 200AH is the most expensive server in this group, but it was also consistently fast in all our file transfer

benchmarks. You'll almost certainly need to budget for more storage and an operating system, but if you need the fastest possible network storage, it's the one to buy.

For most people, though, we recommend the RL Supplies Modula HS500. It's reasonably fast when acting as network storage, and its removable drive trays and RAID 5 array make it

BEST BUY
RL SUPPLIES
Modula HS500
 ★★★★★



easy to keep your data secure. With plenty of storage and an operating system included for £500, it's excellent value and our Best Buy.



MANUFACTURER	EVESHAM	FUJITSU SIEMENS	PC NEXTDAY	RL SUPPLIES
Model name	SilverEDGE 200AH	Primergy Econel 100	Zoostorm 7-3320	Modula HS500
Rating	★★★★	★★★	★★★	★★★★★
Processor	Intel Pentium D 925	Intel Pentium 4 531	Intel Core 2 Duo E4400	AMD Athlon 64 X2 4000+
Processor speed	3GHz	3GHz	2GHz	2.1GHz
Processor socket	LGA775	LGA775	LGA775	Socket AM2
Level I cache	16KB	16KB	32KB	64KB
Level II cache	2,048KB	1,024KB	2,048KB	512KB
Memory installed	1GB	1GB	2GB	1GB
Memory type	PC2-5300	PC2-4300	PC2-5300	PC2-5300
Maximum memory	8GB	8GB	2GB	16GB
Motherboard	Intel S3000AH	Fujitsu Siemens D2179-R1	Foxconn 945GZ7MC-KRS2H	Gigabyte GA-M61PM-S2
Motherboard chipset	Intel Server 3000	Intel E7230	Intel 945GZ	Nvidia NF6100-430
Memory bus speed	333MHz	266MHz	333MHz	333MHz
BIOS type	Intel	Phoenix	Phoenix	Award
PORTS				
USB2 ports (front/rear)	2/2	2/4	3/4	2/4
FireWire ports (front/rear)	0/0	0/0	0/0	1/1
Networking	2x 10/100/1,000	10/100/1,000	10/100/1,000; 802.11a/b/g	10/100/1,000
Legacy ports	2x PS/2, serial	Parallel, 2x PS/2, serial	Parallel, 2x PS/2, serial	Parallel, 2x PS/2, serial
INTERNAL EXPANSION				
Case	Midi tower	Midi tower	Midi tower	Midi tower
Case size HxWxD	432x250x499mm	388x210x500mm	370x188x440mm	440x208x486mm
PCI (free)	2 (2)	4 (4)	2 (2)	2 (2)
PCle x1 (free)	1 (1)	1 (1)	1 (0)	1 (1)
PCle x8 (free)	2 (2)	1 (1)	0 (0)	0 (0)
PCle x16 (free)	0 (0)	1 (1)	1 (1)	1 (1)
AGP (free)	0 (0)	0 (0)	0 (0)	0 (0)
Serial ATA (free)	4 (2)	4 (3)	4 (1)	4 (1)
Memory (free)	4 (2)	4 (2)	2 (0)	4 (3)
Drive bays 3½in (free)	5 (2)	5 (4)	6 (2)	5 (4)
Drive bays 5¼in (free)	4 (3)	3 (2)	2 (1)	2 (1)
BOOT HARD DISKS				
Model	2x Western Digital REWD1600YS	Western Digital Caviar SE WD1600JS-55NCB1	Western Digital Caviar SE WD2500AAJS-32RYA	Hitachi Deskstar HDS721680PLA
Interface	SATA 300	SATA 300	SATA 300	SATA 300
Spin speed	7,200rpm	7,200rpm	7,200rpm	7,200rpm
Default RAID	RAID 0	N/A	N/A	N/A
Supported RAID levels	0, 1, 10	0, 1, 10	0, 1, 5, 0+1	0, 1, 5, 0+1
Maximum capacity	320GB	160GB	250GB	80GB
Total formatted capacity	149GB	149GB	232GB	74GB
STORAGE HARD DISKS				
Model	N/A	N/A	2x Western Digital REWD3200YS-01PGB0	3x Hitachi Deskstar T7K500 HDT725025VLA380
Interface	N/A	N/A	SATA 300	SATA 300
Spin speed	N/A	N/A	7,200rpm	7,200rpm
Default RAID level	N/A	N/A	RAID 0	RAID 5
Supported RAID levels	N/A	N/A	0, 1, 5, 0+1	0, 1, 5, 0+1
Maximum capacity	N/A	N/A	640GB	750GB
Total formatted capacity	N/A	N/A	598GB	465GB
GRAPHICS				
Technology	Integrated	Integrated	Integrated	Integrated
Graphics chipset	ATI ES1000	ATI Rage XL	Intel Graphics Media Accelerator 950	Nvidia GeForce 6150SE
Graphics/video ports	D-sub	D-sub	D-sub	D-sub
SOUND				
Sound card	None	None	RealTek ALC861	RealTek ALC883
Sound card outputs	N/A	N/A	5.1 line out	7.1 line out
REMOVABLE DRIVES				
Floppy drive 3½in	Yes	No	No	No
Memory card reader	None	None	CompactFlash, Secure Digital, MultiMedia Card, Memory Stick, Smart Media, MicroDrive, xD	None
Optical drive	TSST SH-D162C (16X DVD-ROM, 48X CD-ROM)	LG GDR 8164B (16x DVD-ROM, 52x CD-ROM)	TSST SH-S182D (18X DVD+R, 18X DVD-R, 8X DVD+RW, 6X DVD-RW, 8X DVD+R DL, 8X DVD-R DL, 12X DVD-RAM, 48X CD-R, 32X CD-RW, 16X DVD-ROM, 48X CD-ROM)	TSST SH-S182D (18X DVD+R, 18X DVD-R, 8X DVD+RW, 6X DVD-RW, 8X DVD+R DL, 8X DVD-R DL, 12X DVD-RAM, 48X CD-R, 32X CD-RW, 16X DVD-ROM, 48X CD-ROM)
Removable hard disk bays	None	None	None	3
OTHER HARDWARE				
Modem	No	No	No	No
Keyboard	None	Fujitsu Siemens KBPC SX GB	None	None
Mouse	None	Logitech Pilot Wheel Mouse M-SB96	None	None
Keyboard/mouse rating	N/A	★	N/A	N/A
SOFTWARE				
Software	None	Primergy ServerView Suite	BullGuard Internet Security 2007, Microsoft Office 2007 Home and Student Edition	2BrightSparks SyncBack SE 4.2.1, Avira AntiVir Personal Edition 7.00.04.15
Operating system included	None	None	Windows XP Professional Edition	Windows XP Professional Edition
Operating system restore option	N/A	N/A	Windows disc	Windows disc
Other operating system options	Windows Server 2003 R2 (£517), Windows 2003 Small Business Server R2 Standard Edition (£353), Windows 2003 Small Business Server R2 Premium Edition (£764)	None	Windows Small Business Server 2003 (£225)	No OS (-£88), Windows Small Business Server 2003 (£181), Windows Server 2003 Standard 32bit R2 Edition 5 Users (£333)
BUYING INFORMATION				
Parts and labour warranty	One year onsite	One year onsite	One year onsite	Two years RTB
Tech support times	9am-5.30pm Mon-Sat	9am-5.30pm Mon-Fri	9am-6pm Mon-Fri	10am-4pm Mon-Fri
Company founded	1983	1999	1993	1996
Tech support staff	82	Not disclosed	25	3
Employees	418	Not disclosed	Not disclosed	17
Price including delivery (inc VAT)	£586	£322	£479	£500
Price including delivery (ex VAT)	£499	£274	£408	£426
Supplier	Evesham 08701 609500	www.it247.com	PC Nextday	RL Supplies 01923 896996
Details	www.evesham.com	www.fujitsu-siemens.co.uk	www.pcnextday.co.uk	www.rlsupplies.co.uk